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Coherence-path-information duality relation for N paths MARK HILLERY, Department of Physics, Hunter College of CUNY, EMILIO BAGAN, Fisica Teorica: Informacio i Fenomens Quantics, Universitat Autonoma de Barcelona, JANOS BERGOU, Department of Physics, Hunter College of CUNY — For an interferometer with two paths, there is a duality relation between the information about which path the particle took and the visibility of the interference pattern at the output. The more path information we have, the smaller the visibility, and vice versa. We generalize this relation to a multi-path interferometer, and we substitute a recently defined measure of quantum coherence for the visibility. The path information is provided by attaching a detector to each path and applying the minimum-error state discrimination procedure to the detector states.

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